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Miedtke

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(54) **RACK ASSEMBLY**

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(52) **U.S. Cl.**
CPC ***A47B 88/0014*** (2013.01)

(58) **Field of Classification Search**
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USPC 312/330.1, 334.27, 334.29, 334.31, 312/334.32, 334.35, 126–132; 108/143; 211/126.15, 41.11, 42, 43, 184, 74
See application file for complete search history.

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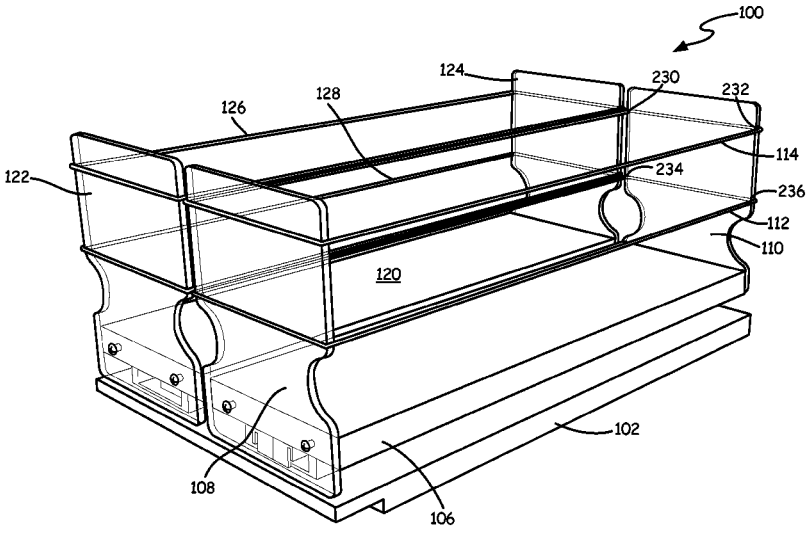
(57) **ABSTRACT**

A rack assembly has a shelf attached to a slidable mount. A front wall and a back wall are mounted to the shelf. At least one elastic element extends between the front wall and the back wall above a left side and a right side of the shelf such that the front wall, back wall and at least one elastic element define a contained area capable of holding objects.

19 Claims, 11 Drawing Sheets



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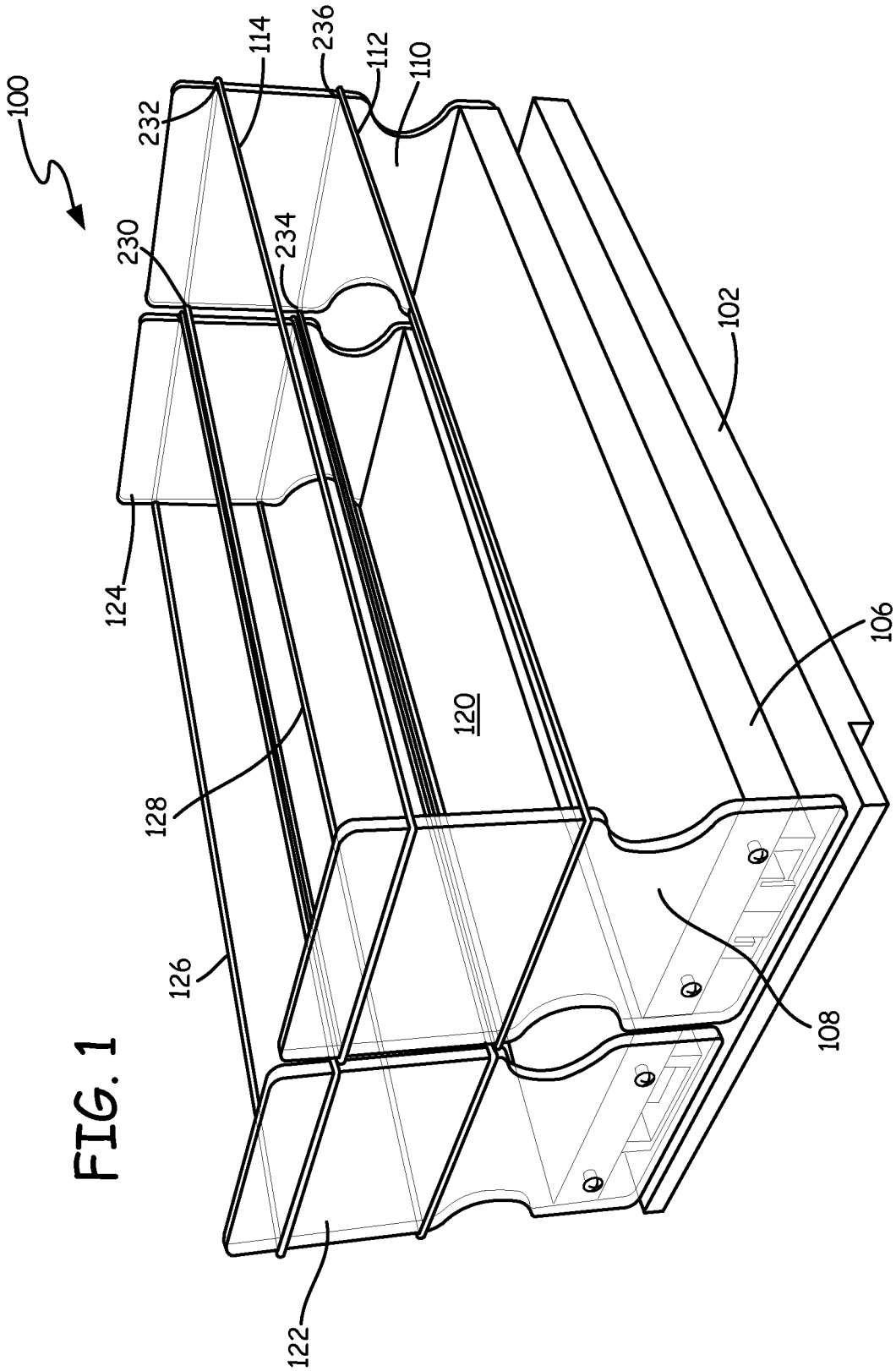


FIG. 1

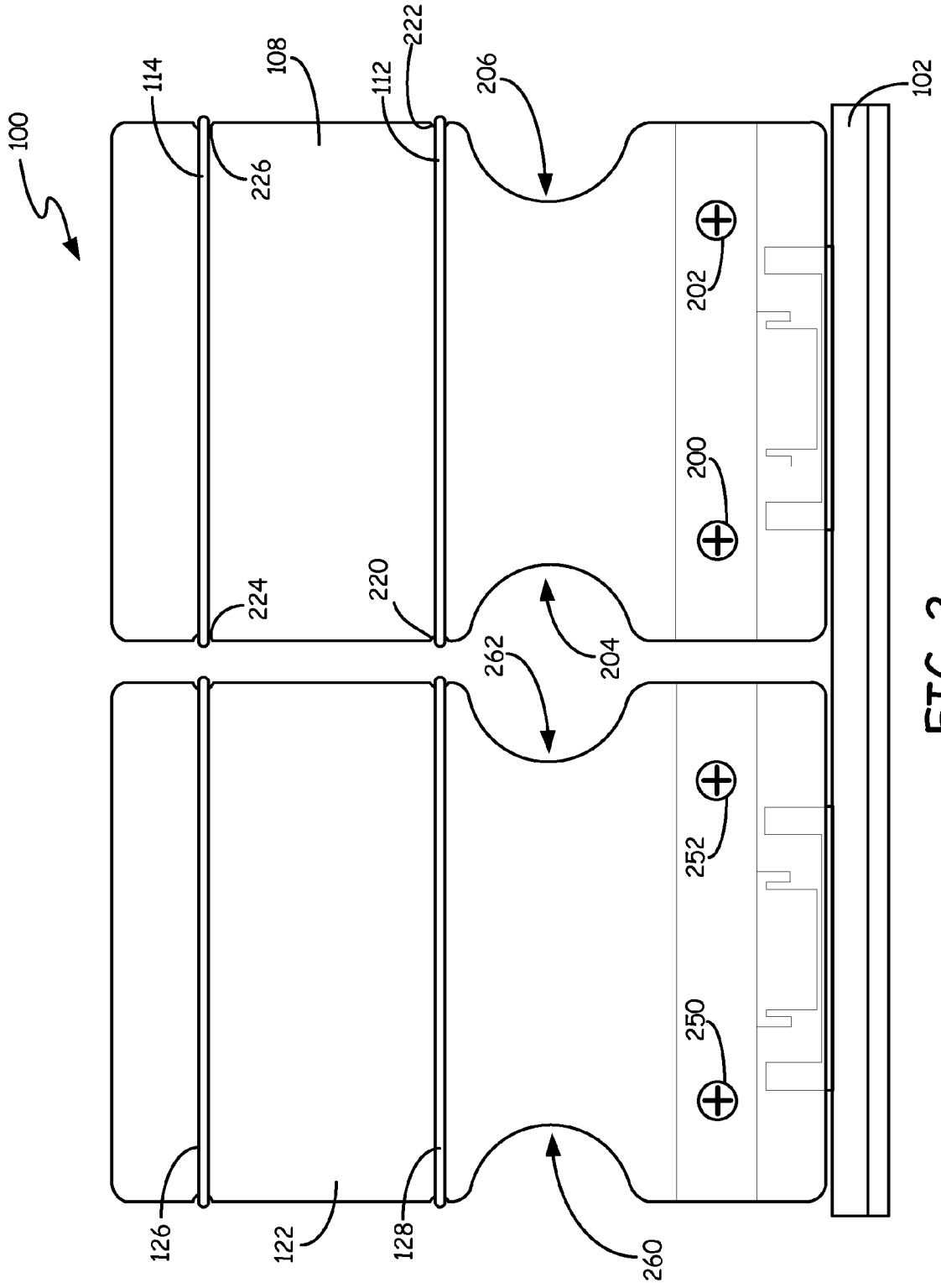

100
114
108
112
222
206
102
226
202
200
224
220
262
204
252
250
126
122
128
260

FIG. 2

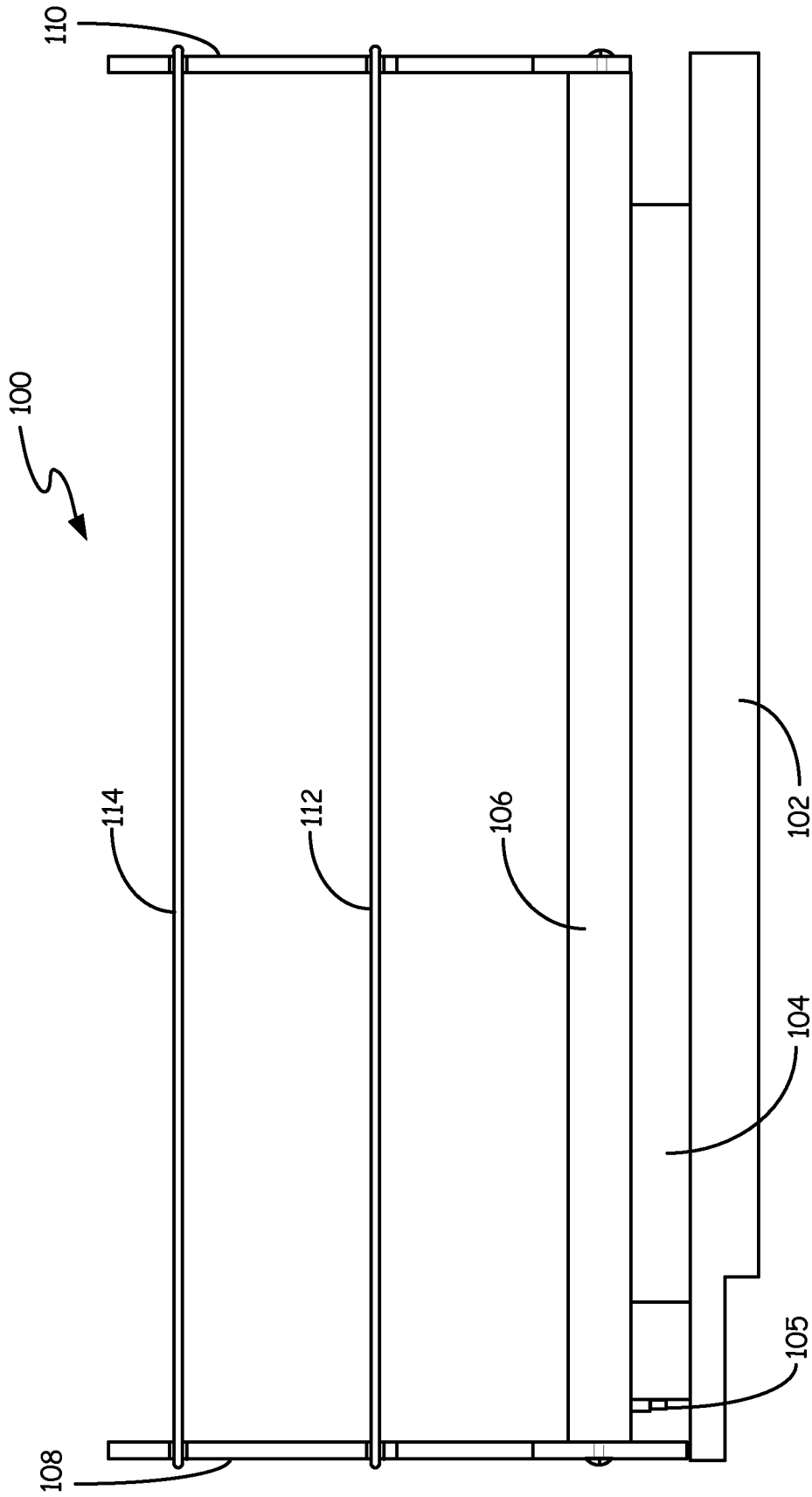


FIG. 3

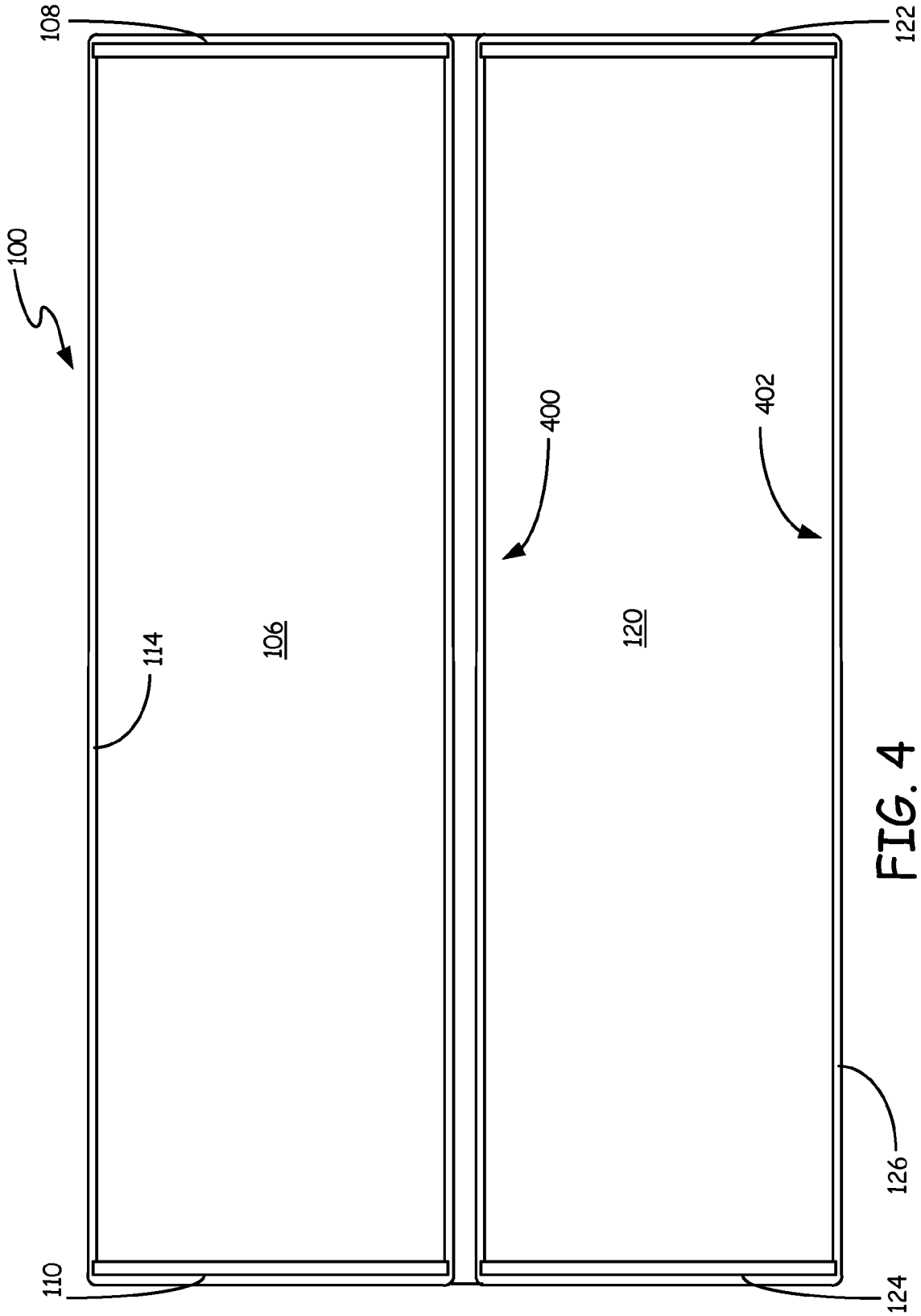


FIG. 4

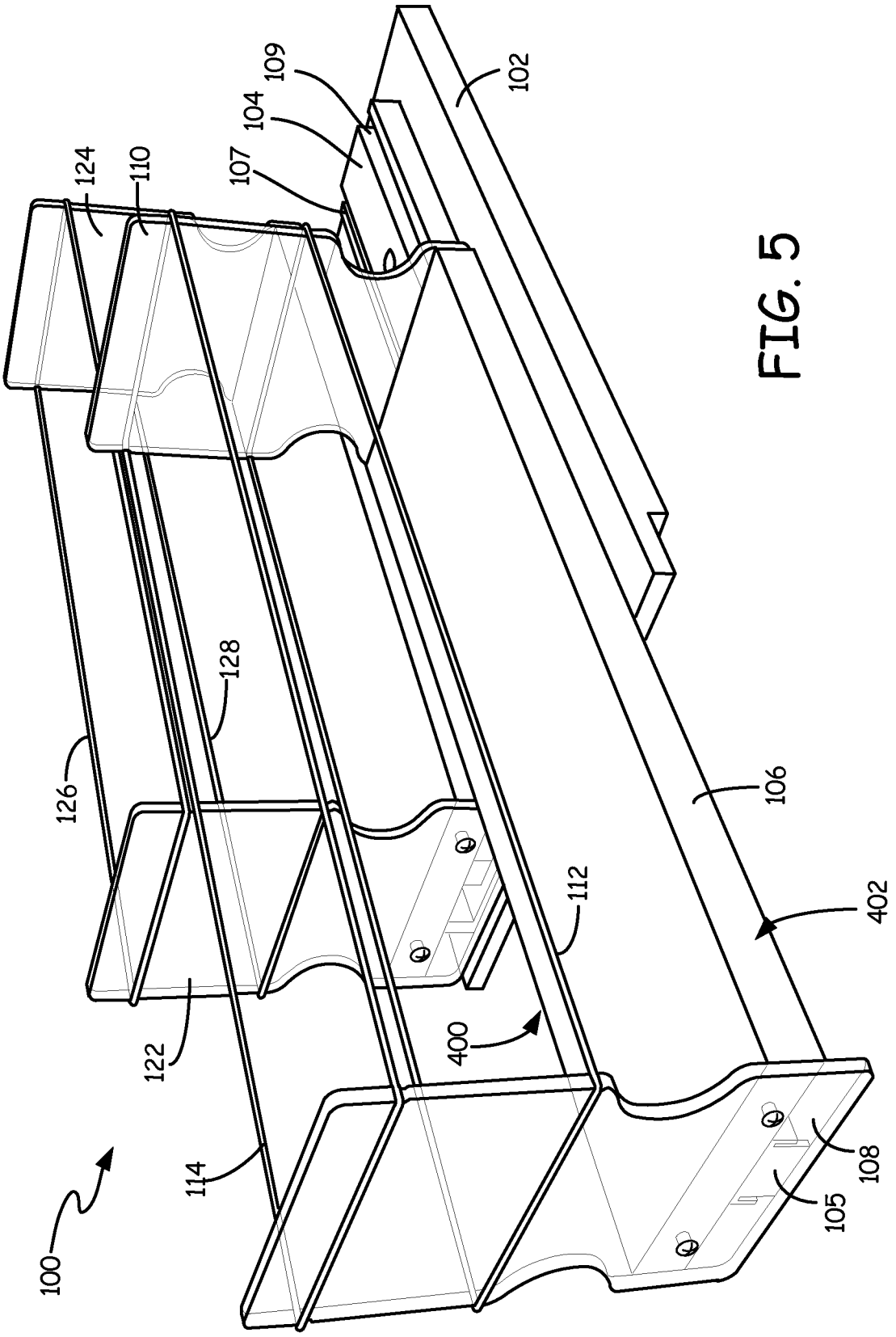

100
102
104
105
106
107
108
109
110
112
114
122
124
126
128
400
402

FIG. 5

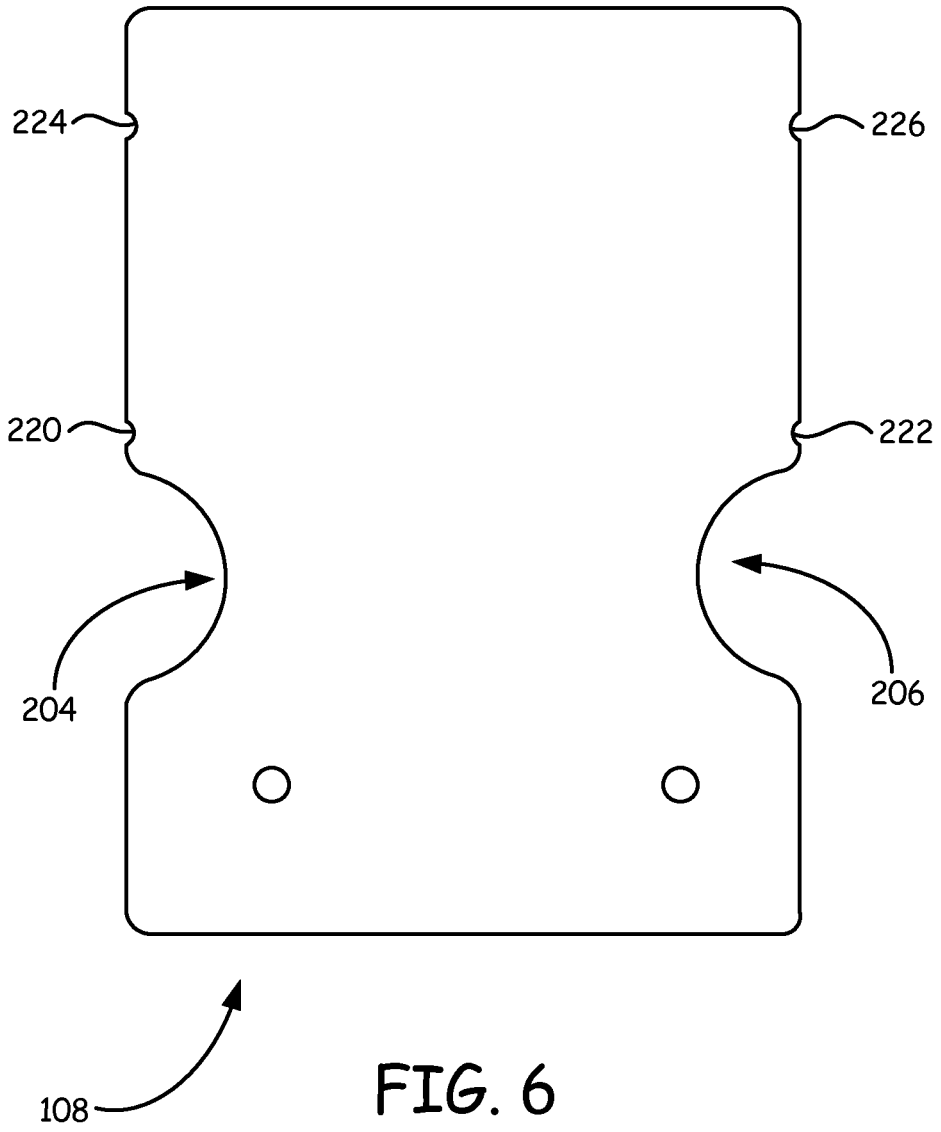


FIG. 6

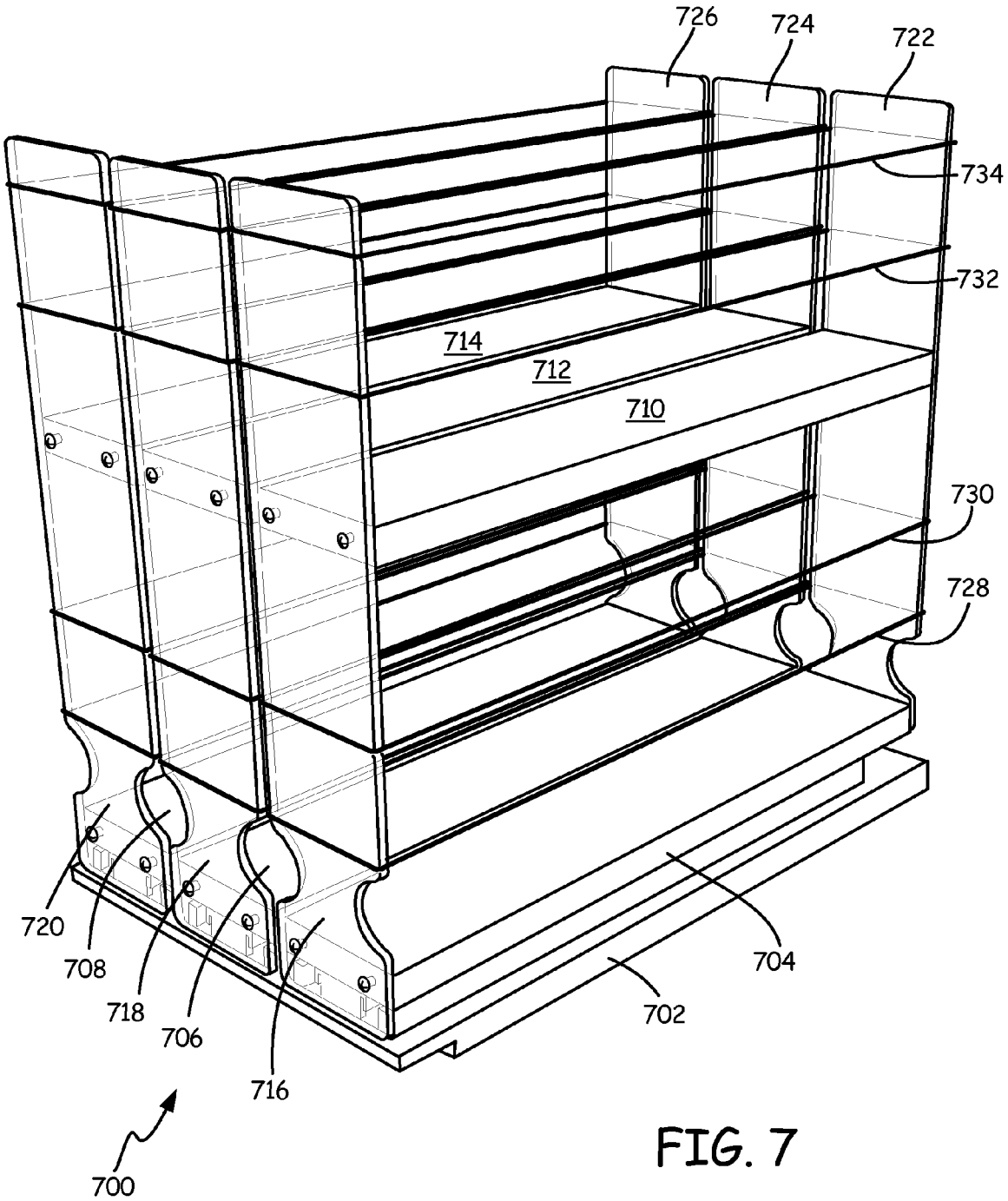

726
724
722
734
732
714
712
710
730
728
720
708
718
706
716
704
702
700

FIG. 7

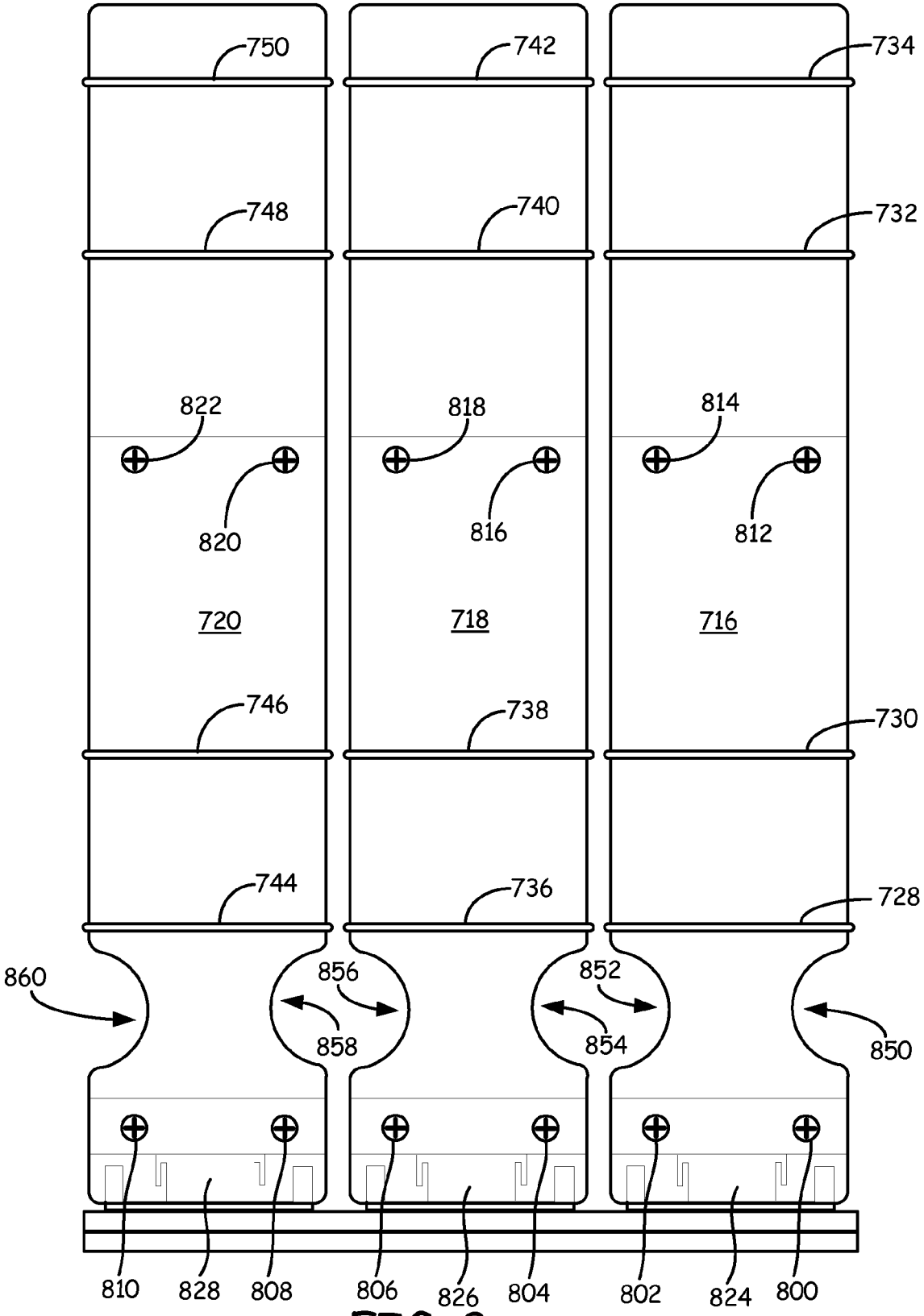
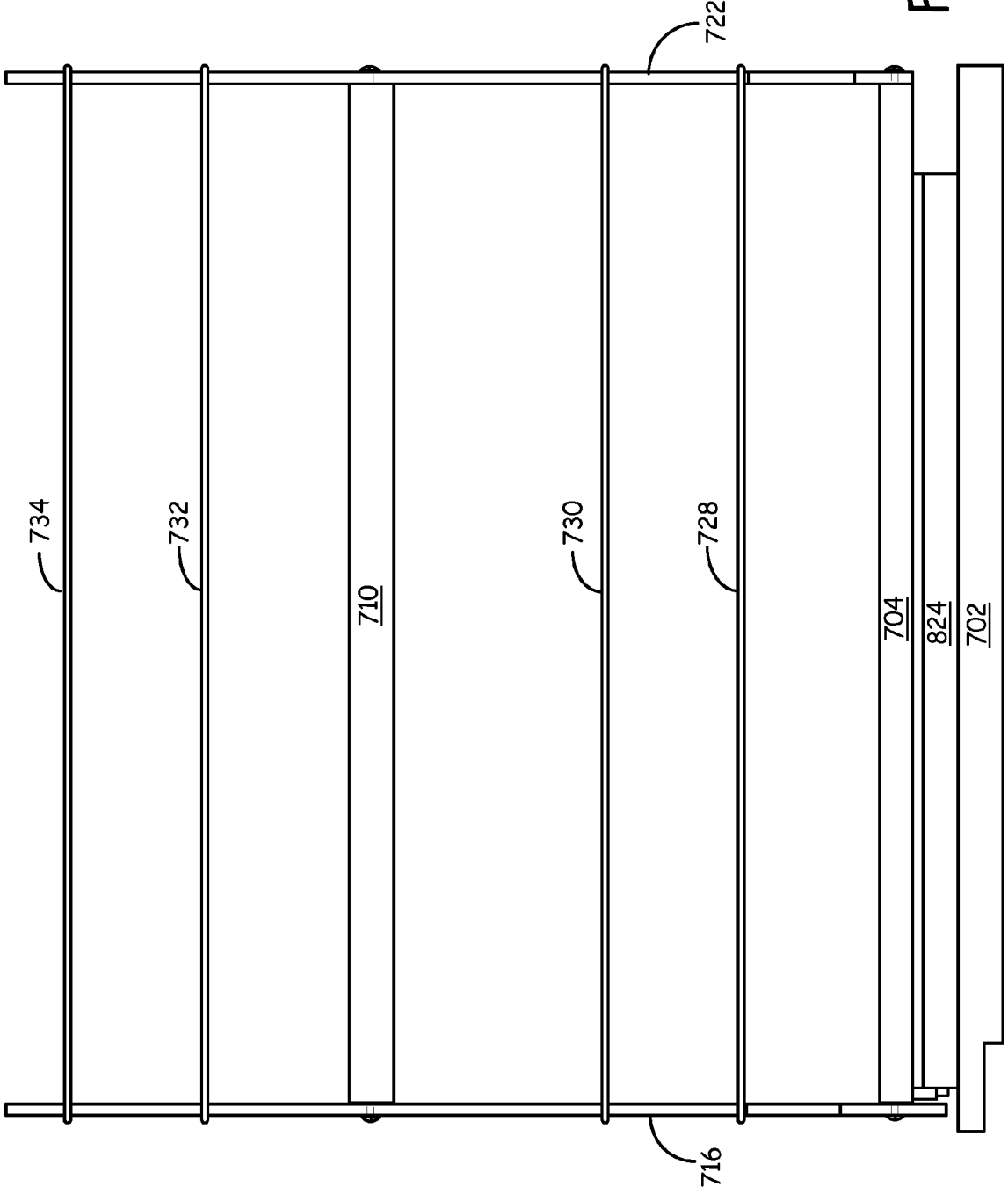

750
742
734
748
740
732
822
818
814
820
816
812
720
718
716
746
738
730
744
736
728
860
856
852
858
854
850
810
828
808
806
826
804
802
824
800

FIG. 8

FIG. 9



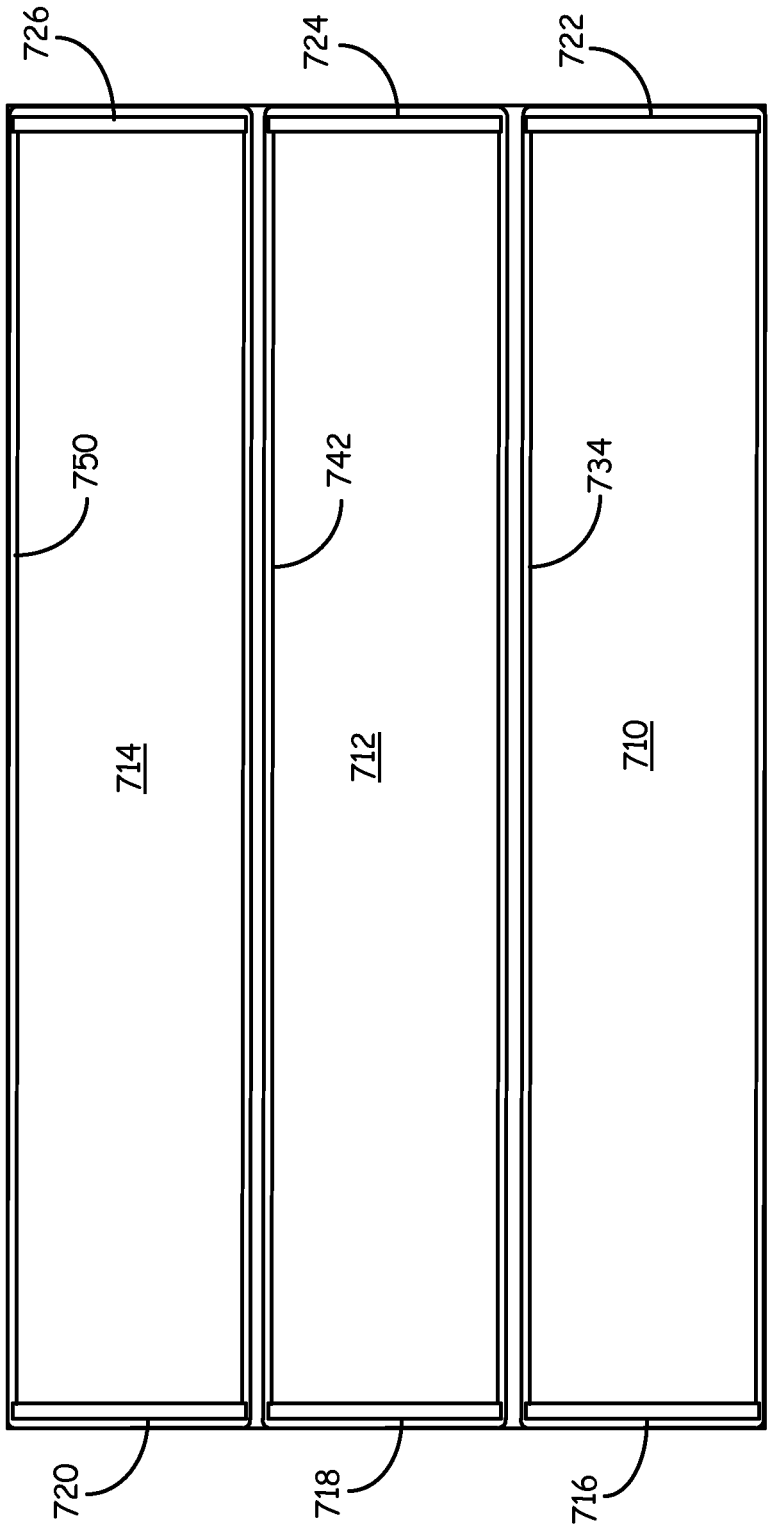


FIG. 10

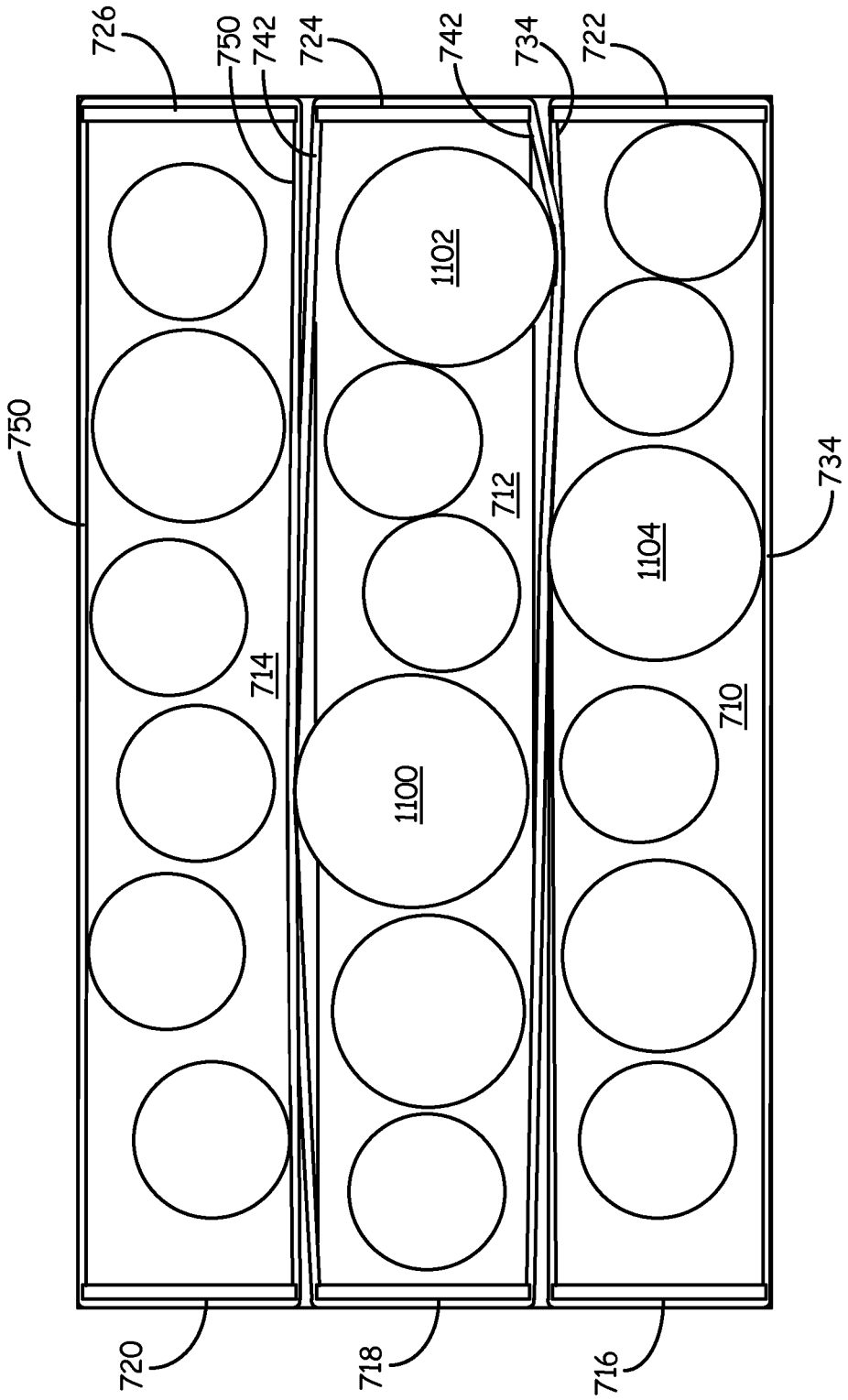

726
750
742
724
742
734
722
750
1102
712
734
1104
714
710
1100
720
718
716

FIG. 11

RACK ASSEMBLY

BACKGROUND

In cabinets, it can be difficult to reach some items because they are stacked behind other items. To overcome this, pullout drawers and shelving have been introduced that allow items to be pulled out of the cabinet on the drawers or shelving, thereby giving more direct access to the items.

The discussion above is merely provided for general background information and is not intended to be used as an aid in determining the scope of the claimed subject matter. The claimed subject matter is not limited to implementations that solve any or all disadvantages noted in the background.

SUMMARY

A rack assembly has a shelf attached to a slidable mount. A front wall and a back wall are mounted to the shelf. At least one elastic element extends between the front wall and the back wall above a left side and a right side of the shelf such that the front wall, back wall and at least one elastic element define a contained area capable of holding objects.

Shelves have a first shelf and a second shelf in parallel with the first shelf. An elastic element retains items so that the items do not fall off the first shelf but allows the items to extend out from the first shelf to make contact with the second shelf.

A bin has a slide mount for mounting within a cabinet. A bottom plate is attached to the slide mount such that the bottom plate can slide out of the cabinet. A front plate is mounted to the bottom plate and extends upward from the bottom plate. A back plate is mounted to the bottom plate and extends upward from the bottom plate. An elastic band extends around a front of the front plate and a back of the back plate.

This Summary is provided to introduce a selection of concepts in a simplified form that are further described below in the Detailed Description. This Summary is not intended to identify key features or essential features of the claimed subject matter, nor is it intended to be used as an aid in determining the scope of the claimed subject matter.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is perspective view of a first embodiment of a rack assembly.

FIG. **2** is a front view of the rack assembly of FIG. **1**.

FIG. **3** is a side view of the rack assembly of FIG. **1**.

FIG. **4** is a top view of the rack assembly of FIG. **1**.

FIG. **5** is a perspective view of the rack assembly of FIG. **1** with one shelf slid outward.

FIG. **6** is a front view of a front panel.

FIG. **7** is a perspective view of a second embodiment of a rack assembly.

FIG. **8** is a front view of the rack assembly of FIG. **7**.

FIG. **9** is a side view of the rack assembly of FIG. **7**.

FIG. **10** is a top view of the rack assembly of FIG. **7**.

FIG. **11** is a top view of the rack assembly of FIG. **7** with items installed in the rack assembly.

DETAILED DESCRIPTION

In prior art pullout shelves and drawers, the sidewalls of the pullout shelves and drawers are rigid. As a result, the shelves or drawers do not accommodate items that are slightly bigger than the width of the shelf or drawer. In addition, the rigidity of the sidewalls can make it more difficult to insert items into a crowded shelf since these sidewalls will not bend outward to accommodate an additional item. To overcome this, the present inventors have created pullout or slidable shelving that includes elastic side elements that can bend outward to accommodate items on the shelving but that also prevent items on the shelving from falling off the shelving.

FIG. **1** provides a perspective view of one embodiment of a rack assembly **100**. FIGS. **2**, **3** and **4** provide a front, right side and top view of rack assembly **100** of FIG. **1**. FIG. **5** provides a perspective view of rack assembly **100** of FIG. **1** with one shelf slid outward. The left side view of rack assembly **100** is a mirror image of the right side view of FIG. **3**.

Rack assembly (also referred to as a bin or shelves) **100** includes a base **102** configured to be mounted to a shelf within a cabinet. A slidable mount or slide mount **104** is mounted to base **102** and includes one or more ball bearing elements that allow a slide arm **105** to move along tracks **107** and **109**. A shelf or bottom plate **106** is attached to arm **105** and as such, can also slide along tracks **107** and **109**.

Shelf **106** has a front end that is attached to a front plate **108**, also referred to as a front wall or a front panel, which extends upward from shelf **106**. In one embodiment, front plate **108** is attached to shelf **106** with two screws **200** and **202**. Front plate **108** includes two recesses **204** and **206** on opposite sides of front plate **108** that are positioned below two elastic elements **112** and **114**. A back of shelf **106** is connected to a back plate **110**, also referred to as a back wall or back panel, which extends upward from shelf **106**. Elastic elements **112** and **114** extend between front plate **108** and back plate **110**. In one embodiment, elastic elements **112** and **114** are elastic bands that extend around the front surface of front plate **108** and around the back surface of back plate **110** and extend above left side **400** and right side **402** of shelf **106**. Elastic elements **112** and **114** fit within notches such as notches **220**, **222**, **224** and **226** in front plate **108** and notches **230**, **232**, **234** and **236** in back plate **110**. The notches maintain elastic elements **112** and **114** at a desired height along front plate **108** and back plate **110**. Elastic bands **112** and **114** are space apart vertically to provide two levels of lateral support to objects on shelf **106**.

Elastic elements **112** and **114** may be elastically displaced toward the center of shelf **106** or outwardly beyond sides **400** and **402** of shelf **106**. Since elastic elements **112** and **114** are resilient, they will exert a force to return to the state shown in FIGS. **1-5** if they are pushed inward or outward.

Rack assembly **100** also includes a second shelf **120** that is similarly positioned on a slide mount that is parallel to slide mount **104** such that shelf **120** may be slid along a track of the slide mount and out of a cabinet. Shelf **120** is in parallel with shelf **106** such that a line from the front to back of shelf **106** along a side of shelf **106** is parallel to a line from font to back of shelf **120** along a side of shelf **120**. Shelf **120** is attached to front plate **122** and back plate **124** in a similar fashion as front plate **108** and back plate **110** are attached to shelf **106**. Elastic bands **126** and **128** extend around the front of front plate **122** and around the back of back plate **124** and are positioned within notches in those plates. Elastic bands **126** and **128** are resilient and will exert a counteracting force when displaced to the sides of shelf **120**.

Front plate **122** is attached to shelf **120** by fasteners such as fasteners **250** and **252**. Front plate **122** includes two recesses **260** and **262** where recess **262** cooperates with recess **204** of front plate **108** to create a space that is large enough for a person's finger to fit between front plate **122** and front plate **108**. Specifically, when the front surfaces of front plate **108** and front plate **120** are aligned in a same plane, the space

created by recesses **262** and **204** allow a finger to be inserted between front plate **122** and front plate **108**. This allows the user to pull on either front plate **122** or front plate **108** to slide shelf **120** or shelf **106** out from the cabinet. In accordance with one embodiment, recesses **204** and **262** have an interior radius of 0.5 inches and are located 1.7 inches from the base of their respective front plate. In accordance with one embodiment, front plates **108** and **122** and back plates **110** and **124** are made of polyethylene terephthalate glycol-modified (PETG) and are transparent to provide a better view of items stored on shelves **106** and **120**.

Front plate **108**, back plate **110** and elastic elements **112** and **114** define a contained area capable of holding items or objects. Elastic elements **112** and **114** retain items so that they do not fall off shelf **106** but allow the items to extend out from shelf **106** so that the items can make contact with shelf **120**. Thus, elastic elements **112** and **114** may be stretched by items or objects on shelf **106** sufficiently for items on shelf **106** to make contact with shelf **120**. In some cases, elastic bands **126** and **128** are stretched by items extend from shelf **106** to shelf **120**. Front plate **122**, back plate **124** and elastic bands **126** and **128** define a second contained area capable of holding additional objects where elastic bands **126** and **128** retain items on shelf **120** so they do not fall off shelf **120** but allow the items on shelf **120** to extend off the side of shelf **120** so that items on shelf **120** may make contact with shelf **106**.

FIG. **6** provides a front view of front plate **108** in isolation. In FIG. **6**, the notches used to hold elastics elements **112** and **114** are shown more clearly as notches **600**, **602**, **604** and **606**. In accordance with some embodiments, each notch is a half circle with a radius of 0.05 inches. In other embodiments, the notches have other shapes and sizes.

FIGS. **7**, **8**, **9** and **10** provide a front perspective view, a front view, a right side view and top view, respectively, of a second embodiment of a rack assembly (also referred to as a bin or shelves) **700**. The left side view of rack assembly **700** is the mirror image of the right side view of FIG. **9**. Rack assembly **700** includes a base **702** having slide mounts **824**, **826** and **828** mounted thereon. Shelves **704**, **706** and **708** are mounted to slide mounts **824**, **826** and **828** such that shelves **704**, **706** and **708** may be slid outward from base **702** when base **702** is mounted within a cabinet.

A front plate **716** and a back plate **722** are attached to shelf **704**; a front plate **718** and a back plate **724** are attached to shelf **706**; and a front plate **720** and a back plate **726** are attached to shelf **708**. Under some embodiments, the front plates are attached to the shelves using fasteners such as screws **800**, **802**, **804**, **806**, **808** and **810** as shown in FIG. **8**. Front plates **716**, **718** and **720** each include pairs of recesses **850**, **852**; **854**, **856**; and **858**, **860**, respectively. Recesses **852** and **854** cooperate to define a space into which a user may place one of their fingers to grab either front plate **716** or front plate **718**. Recesses **856** and **858** define an opening into which a user may insert a finger to grab either front plate **718** or front plate **720**.

Two elastic bands **728** and **730** extend around the front of front plate **716** and around the back of back plate **722** above shelf **704** and recesses **850** and **852**. Elastic bands **736** and **738** extend around the front of front plate **718** and the back of back plate **724** above shelf **706** and recesses **854** and **856**. Elastic bands **744** and **746** extend around the front of front plate **720** and the back of back plate **726** above shelf **708** and recesses **858** and **860**.

Elastic bands **728** and **730**, front plate **716** and back plate **722** together define a contained area on shelf **704** in which objects may be placed such that the objects do not fall off shelf **704** but are allowed to extend over the sides of shelf **704** by stretching elastic bands **728** and **730** outward from the center of shelf **704**. In some embodiments, the objects may stretch elastic bands **728** and **730** sufficiently for an object on shelf **704** to make contact with shelf **706**. Similarly, elastic bands **736** and **738**, front plate **718** and back plate **724** define a contained area on shelf **706** in which objects may be placed and elastic bands **744** and **746**, front plate **720** and back plate **726** define a third contained area on shelf **708** in which objects may be placed. Elastic bands **736**, **738**, **744** and **746** may be stretched by the objects on their respective shelves allowing the objects to extend off the sides of the shelves but preventing the objects from falling off the shelves.

Attached between front plates **716** and **722** is a raised platform or shelf **710** that is above elastic band **730**. Raised platform **710** is connected to front plate **716** and back plate **722** by fasteners such as screws **812** and **814** shown in FIG. **8**. Above raised platform **710**, elastic bands **732** and **734** extend around the front of front plate **716** and around the back of back plate **722** and above a left side and a right side of raised platform **710**. Front plate **716**, back plate **722**, and elastic bands **732** and **734** define a contained area over raised platform **710** in which objects may be placed. Elastic bands **732** and **734** prevent objects in the contained area from falling off raised platform **710** but allow objects in the contained area to extend over the sides of raised platform **710** and in some embodiments allow the objects to make contact with a second raised platform **712** located between front plate **718** and back plate **724**. Thus, elastic bands **732** and **734** may be stretched to accommodate objects placed on raised platform **710**.

Raised platform **712** is secured to front plate **718** and back plate **724** by screws such as screws **816** and **818** of FIG. **8**. Raised platform **712** is located above elastic bands **736** and **738**. Elastic bands **740** and **742** extend around a front of front plate **718** and a back of back plate **724** above raised platform **712**. Front plate **718**, back plate **724** and elastic bands **740** and **742** define a contained area above raised platform **712** into which objects may be placed. Elastic bands **740** and **742** maintain the objects on raised platform **712** such that the objects do not fall off platform **712**. However, elastic bands **740** and **742** may be stretched by objects placed on raised platform **712** so that the objects extend over the sides of raised platform **712** and in some cases make contact with raised platform **710** and/or raised platform **714**. Raised platform **714** is located between front plate **720** and back plate **726** above elastic bands **744** and **746**. In one embodiment, raised platform **714** is attached to front plate **720** and back plate **726** by screws, such as screws **820** and **822**. Elastic bands **748** and **750** extend around the front of front plate **720** and the back of back plate **726** above raised platform **714**. Elastic bands **748** and **750**, front plate **720** and back plate **726** define a contained area over raised platform **714** into which objects may be placed. Elastic bands **748** and **750** may be stretched by objects placed on raised platform **714** allowing those objects to make contact with raised platform **712** while preventing those objects from falling off raised platform **714**.

Each of slide mounts **824**, **826** and **828** may be slid outward from base **702** independently of the other slide mounts. As a result, shelf **704** and raised platform **710** may be slid outward together on a same track of slide mount **824** while the remaining shelves and raised platforms remain within the cupboard. Similarly, shelf **706** and raised platform **712** may be slid outward and shelf **708** and raised platform **714** may be slid outward on respective tracks of slide mounts **826** and **828**.

Front walls **716**, **718** and **720** and back walls **722**, **724** and **726**, include notches into which elastic bands **728**, **730**, **732**, **734**, **736**, **738**, **740**, **742**, **744**, **746**, **748** and **750** reside. These notches maintain the elastic bands in position as objects are

inserted and removed from the rack assembly. Under one embodiment, the notches have the same shape and dimensions as notches **220**, **222**, **224**, and **226** of FIG. **6**. In one embodiment, front plates **716**, **718** and **720** and back plates **722**, **724** and **726** are made of a plastic material such as PETG. Further, front plates **716**, **718** and **720** are preferably transparent so that it is possible to see the items stored on the shelves and raised platforms.

FIG. **11** provides a top view of rack assembly **700** with items stored on raised platforms **710**, **712** and **714**. As shown in FIG. **11**, an item **1100** on raised shelf **712** stretches elastic band **742** and extends off of raised platform **712** to make contact with platform **710**. Similarly, item **1102** on platform **712** stretches elastic band **742** in the opposite direction from item **1100** allowing item **1102** to extend over the other side of raised platform **712**. Item **1104** stretches elastic bands **734** and **742** allowing item **1104** to extend over the side of raised platform **710** to make contact with raised platform **712**. Thus, as shown in FIG. **11**, items placed in the contained areas defined by the elastic bands, the front plates and the back plates can stretch the elastic bands so that the items extend over the sides of the shelves or raised platforms and in some cases make contact with neighboring shelves or raised platforms.

Although elements have been shown or described as separate embodiments above, portions of each embodiment may be combined with all or part of other embodiments described above.

Although the subject matter has been described in language specific to structural features and/or methodological acts, it is to be understood that the subject matter defined in the appended claims is not necessarily limited to the specific features or acts described above. Rather, the specific features and acts described above are disclosed as example forms for implementing the claims.

What is claimed is:

1. A rack assembly comprising:
a base configured to be mounted to a shelf within a cabinet;
first and second slide mounts mounted to the base;
first and second slides moveable on the first and second slide mounts, respectively;
a first rack portion comprising:
a first bottom plate attached to the first slide;
a first front wall mounted to a front of the first bottom plate;
a first back wall mounted to a back of the first bottom plate; and
at least one first elastic element extending between the first front wall and the first back wall above a left side and a right side of the first bottom plate such that the first front wall, first back wall and at least one first elastic element define a first contained area capable of holding objects and such that the first rack portion has an open top; and
a second rack portion comprising:
a second bottom plate attached to the second slide in parallel with the first base plate;
a second front wall mounted to a front of the second bottom plate;
a second back wall mounted to a back of the second bottom plate; and
at least one second elastic element extending between the second front wall and the second back wall above a left side and a right side of the second bottom plate such that the second front wall, second back wall and at least one second elastic element define a second contained area capable of holding objects and such that the second rack portion has an open top.

2. The rack assembly of claim **1** wherein the at least one first elastic element comprises a first elastic band that extends around a front surface of the first front wall and a back surface of the first back wall.

3. The rack assembly of claim **2** wherein the at least one first elastic element further comprises a second elastic band that extends around the front surface of the first front wall and the back surface of the first back wall and is spaced apart from the first elastic band.

4. The rack assembly of claim **3** wherein the first front wall comprises an upper pair of notches that receive the first elastic band and a lower pair of notches that receive the second elastic band.

5. The rack assembly of claim **4** wherein the first back wall comprises an upper pair of notches that receive the first elastic band and a lower pair of notches that receive the second elastic band.

6. The rack assembly of claim **3** further comprising:
a third elastic band and a fourth elastic band extending around a front surface of the second front wall and a back surface of the second back wall such that the second front wall, second back wall, third elastic band and fourth elastic band define a second contained area capable of holding objects.

7. The rack assembly of claim **6** wherein the first and second front walls each comprises a pair of recesses on opposing sides of the first and second front walls, and wherein when the front surface of the first front wall and the front surface of the second front wall are aligned in a same plane, and a recess of the first front wall and a recess of the second front wall together define a space to allow a finger to be inserted between the first front wall and the second front wall.

8. The rack assembly of claim **1** wherein at least one of the first front wall or the second front wall further comprises a recess adjacent the other of the first front wall or the second front wall, which defines a space to allow a finger to be inserted between the first front wall and the second front wall.

9. The rack assembly of claim **1** wherein the first rack portion further comprises:
a raised platform mounted to the first front wall and the first back wall above the at least one first elastic element; and
a further elastic element extending between the first front wall and the first back wall above a left side and a right side of the raised platform such that the first front wall, first back wall and further elastic element define a second contained area capable of holding objects on the raised platform.

10. Shelves comprising:
a base configured to be mounted to a shelf within a cabinet;
first and second tracks mounted to the base;
a first shelf that slides on the first track;
a second shelf in parallel with the first shelf, wherein the second shelf slides on the second track;
at least one first elastic element extending along opposing sides of the first shelf that retains items so that the items do not fall off the first shelf but allows the items to extend out from the first shelf to make contact with the second shelf such that an item that is wider than the first shelf contacts the at least one first elastic element on the opposing sides of the first shelf; and
at least one second elastic element extending along opposing sides of the second shelf that retains items so that the items do not fall off the second shelf but allows the items to extend out from the second shelf to make contact with the first shelf such that an item that is wider than the

second shelf contacts the at least one second elastic element on the opposing sides of the second shelf.

11. The shelves of claim **10** further comprising a first front panel and a first back panel attached to the first shelf wherein the at least one first elastic element extends between the first front panel and the first back panel.

12. The shelves of claim **11** wherein the at least one first elastic element comprises an elastic band that extends around the first front panel and the first back panel.

13. The shelves of claim **12** further comprising:

a second front panel and a second back panel attached to the second shelf; and

the at least one second elastic element extends between the second front panel and the second back panel.

14. The shelves of claim **12** wherein the at least one second elastic element comprises an elastic band that extends around the second front panel and the second back panel.

15. The shelves of claim **10** further comprising a third shelf above the first shelf that slides with the first shelf on the first track.

16. A bin comprising:

a base configured to be mounted to a shelf within a cabinet;

first and second slide mounts on the base;

a first bottom plate attached to the first slide mount such that the first bottom plate can slide out of the cabinet;

a first front plate mounted to the first bottom plate and extending upward from the first bottom plate;

a first back plate mounted to the first bottom plate and extending upward from the first bottom plate; and

a first elastic band extending around a front of the first front plate and a back of the first back plate such that the bin has an open top;

a second bottom plate attached to the second slide mount such that the second bottom plate can slide out of the cabinet;

a second front plate mounted to the second bottom plate and extending upward from the second bottom plate;

a second back plate mounted to the second bottom plate and extending upward from the second bottom plate; and

a second elastic band extending around a front of the second front plate and a back of the second back plate.

17. The bin of claim **16** further comprising a raised platform mounted to the first front plate and the first back plate above the first elastic band.

18. The bin of claim **17** further comprising a third elastic band extending around the front of the first front plate and the back of the first back plate above the raised platform.

19. The bin of claim **18** wherein the first and second front plates are transparent.

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